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AUTHOR Carey, John; Enerson, Meryl
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ABSTRACT

Based on the responses to a survey sent to 23 electronic text managers, this report provides information on the staffing and training requirements associated with the production of electronic text materials. It is directed primarily towards those in higher education and the nonprofit community, including local colleges, public television stations, and community groups, who seek to offer an electronic text service or create materials that will be carried by an electronic text service. The focus of the report is a series of practical issues related to the hiring, training, and management of a production staff, and the report itself is divided into five sections. Section 1 gives an introduction and general overview to the report; Section 2 discusses hiring and training a staff: what to look for in the backgrounds of potential writer-editors or graphic artists; how to approach the training process; and time required to train staff. Section 3 describes types of electronic text services or production jobs and appropriate staff categories for a production team working in these alternative situations. Section 4 addresses the use of time: planning a production schedule; team coordination; and time required for specific tasks. Section 5 provides a concluding discussion of general lessons and production tips offered by respondents to the survey. Additional readings are suggested in the appendix. (JB)

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Electronic Text Consortium

Electronic Text for Higher Education

San Diego State University, University of Wisconsin, University of Nebraska, WGBH Boston

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STAFFING AND TRAINING REQUIREMENTS FOR ELECTRONIC TEXT PRODUCTION

Report Number Seven
of the
Electronic Text Report Series

U.S. DEPARTMENT OF EDUCATION
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FOR ELECTRONIC TEXT PRODUCTION

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Electronic Text Report Series

Prepared by

John Carey and Meryl Knerson
Greystone Communications

for the

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An Annenberg/CPB Project

The mandate of the Annenberg/CPB Project over a 15-year period is to create innovative, quality college-level materials and to demonstrate unique applications of telecommunications technologies in higher education problems.

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1. INTRODUCTION

This report treats the staffing and training requirements associated with the production of electronic text materials. It is directed primarily towards those in higher education and the nonprofit community. This includes local colleges, public television stations and community groups who seek to offer an electronic text service or create materials that will be carried by an electronic text service. In addition, it is hoped that readers associated with commercial electronic text services will find the report to be useful.

The analysis presented here is based upon a survey of 23 electronic text managers. The respondents to our survey represent both the commercial and nonprofit sectors, come from geographically dispersed regions of the U.S., and are actively involved in the management and production of electronic text services. These individuals provided us with a wealth of practical suggestions and thoughtful reflections about what they have learned. We both thank and acknowledge their contributions. At the same time, we offer the usual caveat that while the report draws directly from the survey, the interpretations and organization of the findings are the sole responsibility of the authors.

The focus of the report is a series of practical issues related to the hiring, training and management of a production staff. It is intended to help those involved in the early stages of planning and organizing an electronic text project. While some specific recommendations are offered, it is important to

note that these are suggestive not prescriptive. Many of the respondents to our survey emphasized that ballpark generalizations about staff needs or production time must be fine tuned for each specific situation. A reader should bear this in mind and view the recommendations here as a starting point for planning, not a set of rigid guidelines.

The sections of the report are organized in a straightforward manner. Section 2 treats hiring and training a staff: what to look for in the backgrounds of a potential writer-editor or graphic artist; how to approach the training process; and time required to train staff. Section 3 describes types of electronic text services or production jobs and appropriate staff categories for a production team working under these alternative situations. Section 4 addresses the use of time: planning a production schedule; team coordination; and time required for specific tasks. Section 5 provides a concluding discussion of general lessons and production tips offered by those whom we surveyed. Additional readings are suggested in the Appendix.

2. HIRING AND TRAINING A STAFF

What To Look For When Hiring

Until recently, it was very difficult to find any personnel trained in electronic publishing. Therefore, most if not all of the staff hired for a new electronic text service were likely to come from related fields. The situation is changing slowly as more commercial electronic text services are launched and with new training programs offered by several universities. Nonetheless, a local college or public television station in the near future will most likely have to rely on hiring and training staff who have no previous experience in electronic text.

Our survey respondents emphasized the value of some experience in journalism for a potential electronic text writer-editor. However, there was much disagreement as to what kind of journalist is best for the job of electronic text writer-editor. Some respondents felt it is best to draw upon print-oriented journalists. Others felt that broadcast journalists, especially those from radio, are best suited to the demands of electronic publishing since they are attuned to the brevity of language required for this new medium. That is, electronic text displays information in 50 to 75 word segments, or, the amount of words and graphics that can fit on a single screen. Experienced writer-editors have found that it is important to write "for the screen" in concise language and brief story length. Whatever field they come from, writers and editors must, our

respondents felt, have an ability to reduce source material to a minimum and to "write tightly." Experience with a wire service or radio news may be helpful for this reason.

Most graphic artists in existing electronic text services have been hired largely on the basis of their demonstrated talent in print graphics. A background of working with computers or computer-related technology is a bonus. However, no one offered us a reliable way to predetermine which print artists would blossom into excellent electronic text artists.

For project managers, the most important criterion appears to be solid managerial expertise. This expertise--the ability to manage people and coordinate the flow of project work--was cited by a large number of our respondents as a key ingredient to the success of an electronic text project.

Just as important as previous experience and skill are the attitudes of potential employees. A versatile, innovative and open-minded staff, one which can enthusiastically take up the challenge of the new medium and dedicate itself to making it work, can be vital to a project. As one respondent expressed it, "Don't start a system unless you honestly like the prospect of working long hours to read about the demise of your business in Forbes and The New York Times." That is, electronic text is a complex, new, changing medium. There is much uncertainty and discouraging news along with tremendous promise in the long term. This environment requires hearty souls who have a pioneering spirit. Even within the local context of a college or public television station, the electronic text staff may not

fit into traditional categories and therefore feel isolated.

Approaches To Training

It was generally agreed by our respondents that some kind of in-house training is necessary to orient new employees to the process of creating electronic text programming. The time required for training varies in relation to the type of system, the background of the new staff member, his or her relative facility for working with the technology and the task at hand, whether writing or graphics creation.

The approach taken to training on an electronic text project can affect the overall efficiency of the project, as well as the attitudes of its members. A number of our survey respondents advised putting one person in charge of training who is knowledgeable about training, rather than leaving it to happen as a haphazard activity taken up by various members of the staff when they have the time. This suggested approach is based on the understanding that not everyone is well-suited to be a trainer and that it is better to draw on the experience of a single individual who is both willing to train others as well as versed in the process. Other advice on training from our survey is not to overburden the inexperienced staff (trainees) during the learning process, although it is accepted that the trainee may be learning while on the job.

Time Required To Train

We asked our respondents to estimate, first, how long it would take for a small, inexperienced group to start a modest

videotex service from scratch--that is, to set-up the equipment and learn how to create a service with only spotty documentation and little outside training available to them. There were a surprising range of estimates for this scenario. Some respondents felt the process could take a year or longer. However, the majority of respondents estimated that the service could be established within an eight week period.

Until recently, most new electronic text groups were indeed left to themselves and forced to learn from scratch. However, there now exists many sources of help in getting started. The Electronic Text Consortium and its members are one such resource. Other university-based and public television groups are available to help as well.

When asked what is the range of time required to train a writer-editor on an electronic text system with good documentation and with which the trainer is very familiar, most responded that an inexperienced but fast learner requires from one day to one week in order to gain proficiency on an easy system. As would be expected, such a person (inexperienced but fast learner) takes somewhat longer to gain proficiency with a complex system--generally, from one to two weeks. Slow learners require approximately one to two weeks to gain reasonable proficiency with an easy system and two weeks or more with a complex system. Table 1 presents the responses to this question.

TABLE 1. TIME REQUIRED TO TRAIN A NEW WRITER-EDITOR*

Trainee Type	Training Time: Easy System	Training Time: Complex System
Inexperienced But Fast Learner	1 - 5 days	1 - 2 weeks
Inexperienced But Slow Learner	1 - 2 weeks	2 weeks or more

* The scenario presented to respondents assumed that the system had good documentation; there were no graphics involved; and the trainer was familiar with the system. Approximately 75 percent of the responses fell within the ranges presented above.

A related question we asked in the survey was, "How long will it take to train a graphic artist to use an electronic text system?" When asked to estimate the range of time required to train a new graphic artist on an electronic text system (again, with good documentation and where the trainer is familiar with the system) responses were less consistent. It is more useful if the responses are stated as a minimum. For example, it will take a minimum of one week to train a fast learner on an easy system and two weeks on a complex system. Some respondents feel it will take much longer than two weeks to gain proficiency on a complex system. For slow learners, it will take a minimum of two weeks to gain reasonable facility with a simple system and three weeks or more on a complex system. Many respondents felt that training a slow learner on a complex electronic text system was itself problematic. Table 2 presents responses to this question.

TABLE 2. TIME REQUIRED TO TRAIN A NEW GRAPHIC ARTIST*

	Minimum Training Time	
Trainee Type	Easy System	Complex System
Fast Learner	1 week	2 weeks
Slow Learner	2 weeks	3 weeks

* The scenario presented to respondents assumed that the system had good documentation; the trainer was familiar with the system; and the trainee was an experienced print artist. Approximately 70 percent of the responses fell close to the figures presented above.

A related issue in these early days of electronic text system development is learning how to use a second system. That is, many groups have begun to learn one system only to find that it is discontinued or that the software is changed radically. We asked respondents to estimate how much time is required for a writer-editor or a graphic artist who has facility with one system to gain reasonable proficiency with a second system. This question also considered the problem of changing technical formats, such as switching from alpha-geometric to alpha-mosaic graphics and vice-versa. There was reasonable concurrence among respondents on this topic. For both categories of learners--writer-editors and graphic artists--the process of learning a new system should not take much more than a week. This appears to be independent of the type of new system being learned. For writer-editors, the process is a little faster than for graphic artists, and may in some cases require only one or two days to make the switch to a new kind of system. Graphic

artists need somewhat longer on average to learn a new system, but in all cases the introduction of a new system does not appear to present a difficult or time-consuming situation for retraining; experience gained on one system appears to be transferable to a considerable extent. However, it should be noted that these estimates assume that the new system works; is supported by good documentation; and that training is available. Table 3 presents responses to this question.

TABLE 3. TIME REQUIRED TO ACHIEVE REASONABLE PROFICIENCY ON A SECOND ELECTRONIC TEXT SYSTEM*

	Learning Time	
Staff Member	Person Knows Alpha-Mosaic System & Must Learn Alpha-Geometric	Person Knows Alpa-Geometric System & Must Learn Alpha-Mosaic
Writer-Editor	1-3 days	1-3 days
Graphic Artist	3-10 days	2-10 days

* The scenario presented to respondents assumed that the new system had good documentation; the trainer was familiar with the new system; and the trainee had already learned one previous system. Approximately 80 percent of the responses fell within the ranges presented above.

Many of our respondents noted an important distinction between "reasonable proficiency" and high quality, creative content. That is, Tables 1,2 and 3 deal with the training time required to learn how to use a system and create frames. A much longer maturation period is required for a person to develop the skills necessary to produce excellent print or graphical content. Further, there is much variability from

one person to another in the time required to achieve this higher level of skill and, as in other fields, some writers and artists will develop superior skills than others.

3. STAFFING REQUIREMENTS

Staffing requirements vary greatly according to the size and complexity of an electronic text service. The smaller the project, the larger the number of tasks and functions that are likely to be involved in any one job. Larger electronic text projects for example may list such job categories as "Senior Art Director," and "Associate Art Director;" smaller services are more likely to group all such functions into a single category, "Graphic Artist." It is also possible that the work associated with creating an electronic text service will be done by individuals whose principal job category is totally unrelated to electronic text, e.g. a newspaper print artist who devotes a few hours a week to the newspaper's electronic text service. However, our respondents felt that a separate staff dedicated to the electronic text service is highly desirable.

In our survey, a number of major functional categories emerged, within which more specific job titles may be grouped. These functional categories are:

- Project management
- Editorial (including research, writing and editing)
- Graphics (including art direction, design and frame creation
- Instructional/content design
- Technical support (engineering)
- Computer programming
- Secretarial

- Administration
- Publicity

The most emphasized job category, both in terms of number of employees required and its overall importance for the service is editorial. The editorial group is viewed as central to the service operation, although all groups serve important functions.

In considering staff size, it may be useful to begin with a few examples and ballpark estimates. Newspapers offering a simple text service on an open cable channel or supporting a small information service on a text-only videotex system average 2 to 3 personnel for editorial work (Renfroe and Criner 1982). The WETA/Alternate Media Center teletext trial in Washington D.C. utilized 5 to 6 editorial staff in providing a service with 80 to 100 frames, many with complex graphics. The BBC suggests that a rough rule of thumb is one person on the journalistic team for every 10 pages of electronic text material in a national teletext service.

In our survey, we considered the staffing requirements for two kinds of services: a local teletext service, and a national videotex service. Both services are educational in whole or in part.

Local Teletext Service

In the first scenario we presented to respondents, a university-affiliated public broadcasting station wants to establish a local teletext service (NABTS) with educational

content and community information. The service would contain 100 frames with daily updating of most frames and hourly updating of a few selected frames. Assuming that the funding for a staff can be found, our respondents suggested a staffing for the teletext service as presented in Table 4 below.

TABLE 4. STAFFING REQUIREMENTS FOR A LOCAL TELETEXT SERVICE

Job Category	Number Required	Part-time/Full-time
Project Manager	1	Full-time
Chief Editor	1	Full-time
Writer-Editors	3	Full-time*
Graphic Artists	2	(1 Full-time; 1 Part-time)
Secretary	1	Full-time
Technical/Engineer	1	Part-time
Programmer/Database Mgr.	1	Part-time

* Many respondents noted that the writer-editors would be spread over more than one shift in the broadcast day.

A few respondents offered comments about full-time and part-time personnel. It was noted that part-time personnel and those on shifts allow for more flexibility on a project and the ability to create a more active (i.e. constantly updated) service. Part-time employees can introduce problems of discontinuity for a service, however, and it is suggested that there be at least one full-time staff person under all circumstances in order to assure continuity and prevent disorganization. Full-time programmers and engineers are not generally required

for a local teletext service. However, some engineering and programming support is necessary. A publicity person is optional and many public television stations might wish to assign this function to the project manager or a general publicity department at the station.

National Videotex Service

We asked our survey respondents to consider a second scenario: an existing videotex group at a public broadcasting station is asked to create an educational videotex service to accompany a major broadcast series (e.g. NOVA). The job involves creating a 200-frame videotex package for each of 13 one-hour programs (which have been completed and are available to the staff immediately). We asked how many people would be needed to staff such a project and how long it would take to create the 13 videotex packages.

The responses varied more for some job categories than for others, reflecting perhaps the different emphases some managers would give to graphics. Overall, however, the responses were consistent in that most felt the time required to complete such a project would be six months. The results of the responses are summarized in Table 5.

TABLE 5. STAFFING REQUIREMENTS TO CREATE 13 (200 FRAME) VIDEOTEX PACKAGES THAT WILL ACCOMPANY A MAJOR EDUCATIONAL BROADCAST TELEVISION SERIES

Job Category	Number Required For A Six Month Production Period	Full-time/Part-time
Project Manager	1	Full-time
Chief Editor	1	Full-time
Editor/Writer	2	Full-time
Graphic Artist	2	Full-time
Instructional/ Content Designer	2	(1 Full-time; 1 Part-time)
Programmer/Database Mgr.	1	Full-time
Technical/Engineering	1	Part-time
Secretary	1	Full-time
Administrator	1	Part-time

There was some inconsistency in responses to this question for the categories of instructional design and programming. Some project managers in our survey estimated significantly greater expenditures of time in these categories than did others--on the level of 27-36 person-months, as compared to only 2-4 person-months of programming, for instance. This discrepancy is perhaps attributable to the different kinds of interactive architecture envisioned by those respondents who listed programming and instructional design as job categories for this project.

4. USE OF TIME

One of the most frequently cited issues, both in our survey responses and the general literature, about staffing and operating a successful electronic text service is teamwork. The ability to work with others, share knowledge about different job functions and involve the entire group in service design issues are all aspects of the team approach. Gwen Nugent and colleagues from the University of Nebraska have remarked, "Experience has shown that a superior product results if all team members can be involved in developing the basic structure, but it should be kept in mind that development time is a function of total team expertise " (Nugent et al, 1983).

Some feel that an electronic text service staff should be "integrated across job functions." That is, staff members should be conversant with the work of other team members. This approach may be better suited to small, university-based services than to large commercial projects where jobs and departments are more likely to be kept apart. Many of our respondents emphasized the importance of establishing areas of responsibility and clearly defining each position, as well as hiring personnel for specific tasks. Rather than being antithetical, these two approaches may simply represent different sides of the problem of team-oriented project management.

Group Use of Time

Project managers were asked to estimate how their electronic text group as a whole spends its time. Table 6 summarizes

their responses.

TABLE 6. HOW AN ELECTRONIC TEXT GROUP AS A WHOLE SPENDS ITS TIME

Activity	Percentage of Time
General Administration	20%
Equipment Maintenance	5
Planning and Flowcharting	20
Writing and Graphics Preparation	25
Actual Frame Creation	30

When asked what elements in a project or staff resources might cause the percentages of time spent on activities outlined in Table 6 to change, a few important issues emerged. These can be classified as basic changes in:

- the system
- the staff
- the service/product

1. Changes in the system. These include both hardware and software-related changes. Hardware-related changes may include the introduction of a more advanced production system, the startup of a new system, or simple expansion of a system. Changes in equipment maintenance requirements would accompany these hardware changes, as might varying requirements for graphics preparation or frame creation. Software-related changes include the introduction of a new editorial or frame creation package, standardization of formats which were previously non-standard,

and the introduction of machine-readable content to the project. It is important to note that system software in general is undergoing rapid change and that there are many attempts underway to introduce automation to the frame creation process in order to reduce current heavy labor requirements in frame creation.

2. Changes in staff. Changes in staffing can affect the group's overall time spent on various tasks. It was suggested that greater efficiency may be realized when there is clear delineation or designation of responsibilities (where there was previous ambiguity or job overlap); staff constancy (where there was previous staff turnover, as may occur in university settings); the introduction of experienced management or the maturation of current management; and with smaller staff size (one respondent argued that smaller staffs are more likely to be efficient in their use of time than larger staffs).

3. Changes in the service/product. Upon introduction of a new service, some activities--notably design and content research--will consume large amounts of time. By the same token, the maturation of a service and the establishment of an audience or user group for it brings a better understanding of the content and service needs; consequently, less time needs to be devoted to design and product planning. Standard formats and graphics templates can assist this process. Also, changing requirements for the service's level of interactivity (branching complexity), altering the "look" of the service (e.g. either toward more sophisticated graphics or the elimination of the graphic component

altogether) and new directions in the content of the service (e.g. more time sensitive information in a teletext service) can all affect the amount of time spent on different activities.

Other changes related to the service which our respondents noted as potentially affecting the use of time on a project include changes in the relationship with information providers or the audience for the service.

Use Of Time By Individual Writer-Editors

The writer-editor is a key person in an electronic text service. We therefore asked our survey respondents to estimate how an electronic text writer-editor spends his or her time. In asking the question, we assumed that the writer-editor does not create any graphics nor perform equipment maintenance. Table 7 summarizes the responses to this question.

TABLE 7. HOW AN ELECTRONIC TEXT WRITER-EDITOR SPENDS TIME

Activity	Percentage of Time
General Administration	10%
Research & Flowcharting	25
Writing/Editing	45
Actual Frame Creation	20

The relationship of design (meaning overall design of the service) to production time has been much discussed. It has been argued that in videotex educational services, instructional design efforts often take on more importance

than production efforts, but as Nugent et al (1983) point out, this is probably too broad a generalization. The relationship between design and production time is highly dependent on the nature of the instructional or interactive sequence, the complexity of branching and the requirements for graphics. Teletext services have less need for interactivity than do videotex services, and therefore less emphasis may be placed on the interactive design element of a teletext project. Open channel scrolling cabletext services may have no interactive components at all, and consequently less time will be spent on design in relation to production for such services.

Finally, there is much interest in the question, "How long does it take to create one frame of text?" We did not ask this in our survey because preliminary discussions with electronic text managers suggested that many would answer (correctly) "It depends upon many factors." Nonetheless, a person who is beginning an electronic text project often seeks some ballpark estimate. To accommodate this, we rely here on some excellent work by Nugent and her colleagues at the University of Nebraska. They investigated this issue in relation to the Nebraska electronic text group's frame creation for INDAX, an alpha-mosaic cabletext service. Nugent distinguishes three categories of frames: all text; text and graphics, in which the graphics fill less than 50 percent of the frame; and, text and graphics, in which graphics fill more than 50 percent of the frame. Further, the Nebraska research distinguishes graphic design and actual frame creation.

Table 8 presents their findings.

TABLE 8. TIME ESTIMATES FOR INDIVIDUAL FRAME CREATION

Function	Est. Time Per Frame
Graphic Design	
Graphics occupy 50% or more of frame	4 hours
Graphics occupy less than 50% of frame	45 minutes
Frame Creation	
Text only	8 minutes
Graphics occupy 50% or more of frame	45 minutes
Graphics occupy less than 50% of frame	20 minutes

Source: University of Nebraska-Lincoln

In addition to the time estimates above, Nugent et al state that some additional time is required for subsequent corrections and changes. Further, these estimates do not include other work associated with design time, e.g. flowchart development.

5. CONCLUSION

In an open-ended section of our survey we asked respondents what lessons they had learned that might be useful to pass along to those who would follow in their footsteps. A few common themes emerged.

First, many respondents noted that setting up a system and training a group inevitably takes longer than one might expect before starting the process. Delays in equipment delivery, software bugs, and coordination with internal administrative groups (e.g. a university telecommunications office that is responsible for telephone lines) all tend to delay startup. At the same time, implementation of an electronic text system is far less problematic than it was four or five years ago. Today, there are many sources of assistance for training and counsel on equipment purchases.

Many individual tasks in electronic text production also require more time than many anticipate. For example, the debugging of flow chart routing structures takes more time than a new instructional designer might expect.

Second, respondents pointed out the continuing state of change in electronic text systems and software. This has a few implications. In some situations, it may be better to lease equipment rather than purchase it in order to keep up with model changes. A related issue is how to update software: does the contract with the software supplier include updates and if so, at what cost? Equipment repairs and technical support

are also more problematic in an environment of continuous change. A group must expect some equipment failures and software problems. The critical questions are whether repairs and programming support can be obtained locally and within a reasonable time frame. In addition, a state of change requires that an electronic text group continuously monitor industry developments, communicate what is happening to all members of the staff, and adapt to the changes.

A third important area identified by respondents is the quality of an electronic text service. How can a group maximize the quality of materials created and delivered to users? Many in our survey noted that good communication and teamwork among the staff is vital to promoting quality of service. Also, strong management skills can help to create an environment where quality is nourished and rewarded. In addition, it was noted that good staff training as such is just the first step in developing a quality product. A longer maturation period is required in order to develop creative skills in electronic text production. On the negative side, quality may be reduced when time is wasted on irrelevant bureaucratic squabbles or taken up by equipment problems, software bugs and deficiencies in the production staff's physical plant.

Respondents also pointed out the potential problems associated with outside information providers. That is, in many educational electronic text projects as well as commercial projects, the electronic text production group works with outside groups who supply information. These outside groups may or

may not have a strong vested interest in getting the product out to users. If their interest is weak they can stymy the efforts of the electronic text production staff.

Finally, some respondents discussed long term needs in electronic text staffing and production. One area of need is general automation: software that can help in editing; automatic conversion of text files from one system to another; graphics templates; and software assistance in flowchart development. Another area of need is better research to guide staff in preparing materials that are effective and attractive. It is towards this latter area of need that much of the work of the Electronic Text Consortium as well as this publication series is directed.

ADDITIONAL READINGS

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